Hybrid system

Your vehicle is a hybrid vehicle. It has characteristics different from conventional vehicles. Be sure you are closely familiar with the characteristics of your vehicle, and operate with care.

The hybrid system combines a gasoline engine and an electric motor (traction motor) according to driving conditions, improving fuel efficiency and reducing exhaust emissions.

1 Gasoline engine
2 Electric motor (Traction motor)

When stopped/during take-off

The gasoline engine stops when the vehicle is stopped. During take-off, the electric motor (traction motor) drives the vehicle. At slow speeds or when traveling down a gentle slope, the engine is stopped and the motor is used.

During normal driving

The gasoline engine is predominantly used. The electric motor (traction motor) charges the hybrid battery as necessary.

When accelerating sharply

The power of the hybrid battery (traction battery) is added via electric motor (traction motor) to that of the gasoline engine.

When braking (Regenerative brake)

The electric motor (traction motor) charges the hybrid battery (traction battery).

Regenerative braking

The motor generator converts kinetic energy to electric energy when:

- The accelerator pedal is released.
- The brake pedal is depressed with the shift lever in “D” or “S”.

n **Conditions in which the gasoline engine may not stop**

The gasoline engine starts and stops automatically. However, it may not stop automatically in the following conditions:

l During gasoline engine warm-up

l During hybrid battery (traction battery) charging

l During low or high hybrid battery (traction battery) temperature

n **Charging the battery**

l As the gasoline engine charges the hybrid battery (traction battery), the battery does not need to be charged from an outside source. However, if the vehicle is left parked for a long time the hybrid battery will slowly discharge. For this reason, be sure to drive the vehicle at least once every few months for at least 30 minutes or 10 miles (16 km). If the hybrid battery becomes fully discharged and you are unable to jump-start the vehicle with the 12 volt battery, contact your Lexus dealer.

l If the shift lever is in “N”, the hybrid battery (traction battery) will not be charged. When driving in heavy traffic, operate the vehicle with the shift lever in “D” or “S” to avoid discharging the battery.

n **After the 12 volt battery has discharged or has been changed or removed**

The gasoline engine may not stop even if the vehicle is running on the hybrid battery (traction battery). If this continues for a few days, contact your Lexus dealer.

Sounds and vibrations specific to a hybrid vehicle

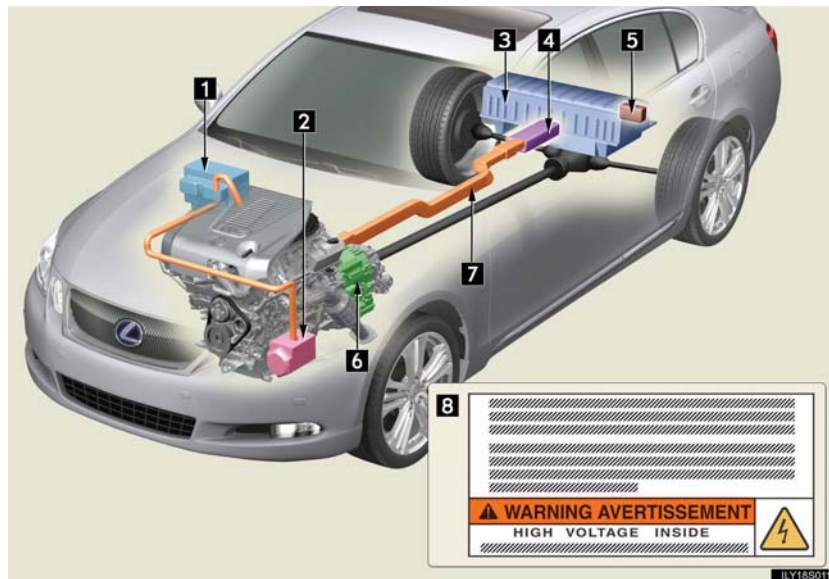
There may be no engine sounds or vibration even though the vehicle is able to move. Always put the shift lever in “P” when parked.

The following sounds or vibrations may occur when the hybrid system is operating, and are not a malfunction.

- Motor sounds may be heard from the engine compartment.
- Sounds may be heard from the hybrid battery (traction battery) behind the rear seat when the hybrid system starts or stops.
- Sounds from the hybrid system may be heard when the trunk lid is open.
- Sounds may be heard from the transmission when the hybrid system starts or stops.
- Engine sounds may be heard when accelerating sharply.
- Sounds may be heard from the regenerative brake when you press the brake pedal.
- Vibration may be felt when the gasoline engine starts or stops.
- You may hear cooling fan sounds coming from the air intake vents behind the rear seat.

Maintenance, repair, recycling, and disposal

Contact your Lexus dealer regarding maintenance, repair, recycling and disposal. Do not dispose of the vehicle yourself.

High voltage components

1 Power control unit
2 Air conditioning compressor
3 Hybrid battery (Traction battery)
4 DC/DC converter
5 Service plug
6 Electric motor (Traction motor)
7 High voltage cables (orange color)
8 Caution label

Take care when handling the hybrid system, as it contains a high voltage system (about 650V at maximum) as well as parts that become extremely hot when the hybrid system is operating. Obey the caution labels attached to the vehicle.

■ **Hybrid battery air vent**

1 Hybrid battery air vent

There is an air intake vent on the package tray for the purpose of cooling the hybrid battery (traction battery). If the vent becomes blocked, the hybrid battery may overheat, leading to a reduction in hybrid battery output.

Emergency shut off system

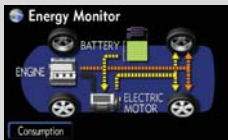
The emergency shut off system blocks off the high voltage current and stops the fuel pump to minimize the risk of electrocution and fuel leakage when a certain level of impact is detected by the impact sensor. If the emergency shut off system activates, your vehicle will not restart. To restart the hybrid system, contact your Lexus dealer.

Energy monitor/consumption screen

You can view the status of your hybrid system on the multi-information display (→P. 155) and the touch screen (→P. 224). The following images are examples only, and may vary slightly from actual conditions.

■ **Energy monitor**

- How to display on the touch screen:

STEP 1 Press INFO.

STEP 2 Touch on the "Information" screen.

If the "Consumption" screen is displayed, touch Energy.

- How to display on the multi-information display:

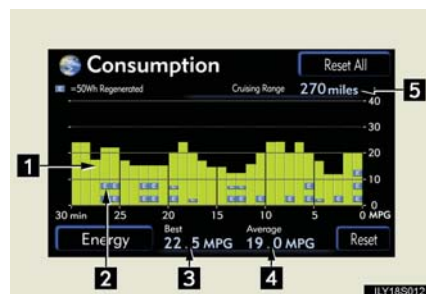
STEP 1 Push the "DISP" switch on the steering wheel several times to select the energy monitor display.

	Touch screen	Multi-information display
When the vehicle is powered by the electric motor (traction motor)		
When the vehicle is powered by the gasoline engine		
When the vehicle is powered by both the gasoline engine and the electric motor (traction motor)		
When the vehicle is charging the hybrid battery (traction battery)		
When there is no energy flow		
Hybrid battery (traction battery) status	Low ↔ Full	Low ↔ Full

Consumption

STEP 1 Press .

STEP 2 Touch on the "Information" screen.

If the "Energy Monitor" screen is displayed, touch Consumption.

1. Fuel consumption in the past 30 minutes
2. Regenerated energy in the past 30 minutes

   One symbol indicates 50 Wh. Up to 4 symbols are shown.
3. Best past fuel consumption
4. Average fuel consumption
5. Cruising range

Resetting the consumption data

Touching Reset will reset the "Average fuel consumption". Touching Reset All will reset all the data (except the "Cruising Range") on the "Consumption" screen.

Hybrid warning message

A message is automatically displayed when a malfunction occurs in the hybrid system or an improper operation is attempted.

If a warning message is shown on the multi-information display and the touch screen, read the message and follow the instructions. (→P. 500)

If a warning light comes on or a warning message is displayed, or the 12 volt battery is disconnected

The hybrid system may not start. In that case, try to start the system again. If the "READY" light does not come on, contact your Lexus dealer.

CAUTION

High voltage precautions

The vehicle has high voltage DC and AC systems as well as a 12 volt system. DC and AC high voltage is very dangerous and can cause severe burns and electric shock that may result in death or serious injury.

- Never touch, disassemble, remove or replace the high voltage parts, cables and their connectors.
- The hybrid system will become hot after starting as the system uses high voltage. Be careful of both the high voltage and the high temperature, and always obey the caution labels attached to the vehicle.
- Never try to open the service plug access hole located in the luggage compartment. The service plug is used only when the vehicle is serviced and is subject to high voltage.

Nickel-metal hydride battery

Your vehicle contains a sealed nickel-metal hydride battery. If disposed of improperly, it is hazardous to the environment and there is a risk of severe burns and electrical shock that may result in death or serious injury.

CAUTION

Road accident cautions

Observe the following precautions to reduce the risk of injury.

- Pull your vehicle off the road, put the shift lever in “P”, apply the parking brake, turn the hybrid system off.
- Do not touch the high voltage parts, cables and connectors.
- If electric wires are exposed inside or outside your vehicle, an electric shock may occur. Never touch exposed electric wires.
- If a fluid leak occurs, do not touch it as it may be strong alkaline electrolyte from the hybrid battery (traction battery). If it comes into contact with your skin or eyes, wash it off immediately with a large amount of water or if possible, boric acid solution. Seek immediate medical attention.
- If a fire occurs in the hybrid vehicle, leave the vehicle as soon as possible. Never use a fire extinguisher that is not meant for electric fires. Using even a small amount of water may be dangerous.
- If your vehicle needs to be towed, do so with the rear wheels raised. If the wheels with the electric motor (traction motor) are on the ground when towing, the motor may continue to generate electricity. This may cause an electricity leakage leading to a fire. (→P. 482)
- Carefully inspect the ground under the vehicle. If you find that liquid has leaked onto the ground, the fuel system may have been damaged. Leave the vehicle as soon as possible.

NOTICE

■ **Hybrid battery air vent**

- Do not put foreign objects over the air vent. The hybrid battery (traction battery) may overheat and be damaged.
- Clean the air vent regularly to prevent the hybrid battery (traction battery) from overheating.
- Do not wet the air vent. It may cause a short circuit and damage the hybrid battery (traction battery).
- Do not load a large amount of water such as an aquarium into the vehicle. If water spills over the hybrid battery (traction battery), the battery may be damaged.